# Nutrition for Later Chronic Kidney Disease in Adults

*National Kidney and Urologic Diseases Information Clearinghouse*

National Institute of Diabetes and Digestive and Kidney Diseases

NATIONAL INSTITUTES OF HEALTH

As kidney disease progresses, nutritional needs change as well. If you have reduced kidney function, your doctor may recommend that you change your diet to protect your kidneys.

You can prevent or delay health problems from chronic kidney disease (CKD) by eating the right foods and avoiding foods high in phosphorus, potassium, and sodium. Eating too much protein can also burden the kidneys and speed the progression of CKD. Protein foods like meat and dairy products break down into nitrogen and creatinine, waste products that healthy kidneys remove from the blood. But diseased kidneys can't stop waste products from building up in the blood and causing health problems.

With reduced kidney function, you may need to start paying attention to the protein, phosphorus, sodium, and potassium content of the foods you eat. Learning about your food will help you understand what changes you need to make.

## Calories

Calories are units of energy provided by food. Work with your dietitian to determine how many calories you need each day to maintain a healthy weight.

As CKD progresses, you may find that foods do not taste the same, and you may lose your appetite. Your dietitian can help you find healthy ways to add calories to your diet if you are losing too much weight.

## Protein

Protein is an essential part of any diet. Proteins help build and maintain muscle, bone, skin, connective tissue, internal organs, and blood. They help fight disease and heal wounds. But proteins also break down into waste products that must be cleaned from the blood by the kidneys. Eating more protein than your body needs may put an extra burden on the kidneys and cause kidney function to decline faster.

Doctors have long recommended that patients with CKD eat moderate or reduced amounts of protein. Some worried, however, that restricting protein would lead to malnutrition in many patients. In the 1990s, a major clinical trial measured the benefits and dangers of protein restriction for kidney patients. The Modification of Diet in Renal Disease (MDRD) Study assigned groups of CKD patients to diets with different levels of daily protein intake. The study found that patients who succeeded in reducing their daily protein intake by 0.2 grams for each kilogram of body weight for 1 year had healthier levels of bicarbonate, phosphorus, and urea nitrogen in their blood.

For example, a man who weighs 154 pounds (70 kilograms) and who normally eats 56 grams of protein a day would have to reduce his protein intake to 42 grams a day. To cut back on protein, he might eat oatmeal at breakfast (6 grams of protein) instead of a bacon, egg, and cheese sandwich (18 grams of protein).

U.S. Department of Health and Human Services

## Medical Nutrition Therapy

Figuring out what to eat can be tricky at first. You may need to cut down on foods you've always considered healthy, like fruits and vegetables. First, you need to learn how certain foods affect your kidneys and how reduced kidney function changes the way your body uses food. Then learn about the nutritional content of foods so you can recognize foods that are acceptable and foods that contain the substances you need to limit or avoid, like sodium, phosphorus, and potassium.

Working with a dietitian can help you understand how foods affect your health. Ask the dietitian to review your lab reports for problems that you can address by changing your diet. For example, your lab report might show a high level of phosphorus in your blood. Your dietitian can show you how to lower your phosphorus level by avoiding high-phosphate foods like dairy products, nuts and peanut butter, beer, cola, canned iced teas and lemonade, and certain vegetables.

Together, you can plan meals that fit your habits and your preferences but also provide the nutrition you need and avoid or restrict the foods that can cause problems.

Ask your doctor to refer you to a dietitian who specializes in nutrition for people with chronic kidney disease. The dietitian's fee may be covered by your health insurance. Check with your insurance provider. You may need a referral from your doctor. If you qualify for Medicare, you can receive a benefit for medical nutrition therapy (MNT) from a registered dietitian or nutrition professional when your doctor provides a referral indicating that you have diabetes or kidney disease. Medicare covers 80 percent of the Medicare-approved amount for MNT after you have paid the $100 deductible for Part B services.

One way to locate a qualified dietitian is to consult the American Dietetic Association website at *www.eatright.org,* which features a "Find a Nutrition Professional" page. Users can enter their address or ZIP code and a list of dietitians in that area will appear. Click on "Renal nutrition" in the specialty field.

The typical American diet contains more than enough protein. Most people can get the protein they need by eating two 3-ounce servings of meat or meat substitute each day. Learning about portion sizes can help you limit your protein intake.

### What's the Right Size?

A 3-ounce serving of meat is about the size of a deck of cards or the palm of your hand. You can moderate your protein intake by limiting meat in your diet to two 3-ounce servings each day.

Talk with your dietitian about the amount of protein and the sources of protein in your diet. Animal sources such as egg whites, cheese, chicken, fish, and red meats contain more of the essential amino acids your body needs. A well-balanced vegetarian meal plan can also provide these nutrients. Your dietitian can suggest ways to make small adjustments in your eating habits that can result in significant protein reduction. For example, you can make sandwiches using thinner slices of meat and filling out the sandwich with lettuce, pickles, cucumber slices, apple slices, and other garnishes.

## Fat

Fat provides energy, helps produce hormone-like substances that regulate blood pressure and other heart functions, and carries fat-soluble vitamins. You need fat in your diet, but some fats are healthier than others. Saturated fats and trans-fatty acids can raise your blood cholesterol levels and cause clogging of blood vessels.

Talk with your dietitian about healthy and unhealthy sources of fat. Saturated fats are found in animal products like red meat, poultry, whole milk, and butter. These fats are usually solid at room temperature. Trans-fatty acids are often found in commercial baked goods like cookies and cakes and in fried foods like doughnuts and french fries.

Your dietitian can suggest healthy ways to get fat into your diet, especially if you need more calories. Vegetable oils like corn or

### Protein Content of Foods

| High-Protein Foods | Lower Protein Alternatives |
|---|---|
| Ground beef | Egg substitutes |
| Halibut | Shrimp |
| Salmon | Tofu |
| Tuna | Imitation crab meat |
| Chicken breast | Chicken drumstick |
| Chili con carne | Beef stew |

**Source:** United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference, Release 17–1 (*www.nal.usda.gov/fnic/foodcomp/Data/SR17/wtrank/sr17a203.pdf;* accessed June 2, 2005)

### Sources of Fats

| Bad Fats | Good Fats |
|---|---|
| Saturated fats<br>• Red meat<br>• Poultry<br>• Whole milk<br>• Butter<br>• Lard | Monounsaturated fats<br>• Corn oil<br>• Safflower oil<br>• Olive oil<br>• Peanut oil<br>• Canola oil |
| Trans-fatty acids<br>• Commercial baked goods<br>• French fries<br>• Doughnuts | |
| Hydrogenated vegetable oils | |

safflower oil are healthier than animal fats like butter or lard. Avoid hydrogenated vegetable oils because they are high in trans-fatty acids. Monounsaturated fats—olive, peanut, and canola oils—are healthy alternatives to animal fats.

## Sodium

Sodium is found in ordinary table salt and many salty seasonings like soy sauce and teriyaki sauce. Canned foods, some frozen foods, and most processed meats have large amounts of table salt. Snack foods like chips and crackers are also high in salt.

Too much sodium in your diet can be harmful because it causes your blood to hold fluid. The extra fluid raises your blood pressure and puts a strain on your heart and kidneys.

Talk with your dietitian about ways to reduce the amount of sodium in your diet. Look for the sodium content on the nutrition labels of the foods you buy. Choose "sodium-free" or "low-sodium" food products. Aim to keep your daily sodium intake less than 1,500 milligrams.

Try alternative seasonings like lemon juice, salt-free seasoning mixes, or hot pepper sauce. But avoid salt substitutes that use potassium.

### Sodium Content of Foods

| High-Sodium Foods | Lower-Sodium Alternatives |
|---|---|
| Salt | Salt-free herb seasonings |
| Canned vegetables | Frozen vegetables |
| Hot dogs | Plain rice |
| Packaged rice with sauce | Plain noodles |
| Packaged noodles with sauce | Unsalted pretzels |
| Frozen vegetables with sauce | Unsalted popcorn |
| Canned soup | |
| Tomato sauce | |
| Snack foods | |

**Source:** United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference, Release 17–1 (*www.nal.usda.gov/fnic/foodcomp/Data/SR17/wtrank/sr17a307.pdf;* accessed June 3, 2005)

## Potassium

Potassium is found in many fruits and vegetables, such as bananas, potatoes, avocados, and melons. Check your blood tests to make sure that your potassium level stays in the normal range. If it begins to climb, talk with your dietitian about ways to limit the amount of potassium you eat. You may need to avoid some fruits and vegetables. You can reduce the potassium content of potatoes by soaking them in water for several hours before cooking.

## Potassium Content of Foods

| High-Potassium Foods | Lower-Potassium Aternatives |
|---|---|
| Oranges and orange juice | Apples and apple juice |
| Melons | Cranberry juice |
| Apricots | Canned fruit |
| Banana | Strawberries, blueberries, raspberries |
| Kiwi | Plums |
| Potatoes | Pineapple |
| Tomatoes | Cabbage |
| Sweet potatoes | Cauliflower |
| Cooked spinach | Mustard greens |
| Beans (baked, kidney, lima, pinto) | Broccoli |

**Source:** United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference, Release 17–1 (*www.nal.usda.gov/fnic/foodcomp/Data/SR17/wtrank/sr17a306.pdf;* accessed June 3, 2005)

## Phosphorus

Phosphorus is a mineral found in many foods. Too much phosphorus in your blood pulls calcium from your bones. Losing calcium will make your bones weak and likely to break. Too much phosphorus may also make your skin itch. Foods like milk and cheese, dried beans, peas, colas, canned iced teas and lemonade, nuts, and peanut butter are high in phosphorus. Talk with your dietitian about how much phosphorus you should have in your diet.

As your kidney disease progresses, you may need to take a phosphate binder like sevelamer hydrochloride (Renagel), calcium acetate (PhosLo), or calcium carbonate (Tums) to control the phosphorus in your blood. These medications act like sponges to soak up, or bind, phosphorus while it is in the stomach. Because it is bound, the phosphorus does not get into the blood. Instead, it is passed out of the body in the stool.

## Fluids

As your kidney disease progresses, you may need to limit how much you drink because your kidneys can't remove the extra fluid, so it builds up in your body and strains the heart. Tell your doctor if you notice you are making either less urine or more urine or if you have any swelling around your eyes or in your legs, arms, or abdomen.

## Phosphorus Content of Foods

| High-Phosphorus Foods | Lower-Phosphorus Alternatives |
|---|---|
| Dairy foods (milk, cheese, yogurt) | Liquid non-dairy creamer |
| Beans (baked, kidney, lima, pinto) | Sherbet |
| Nuts and peanut butter | Pasta rice |
| Processed meats (hot dogs, canned meat) | Rice and corn cereals |
| Cola | Popcorn |
| Canned iced teas and lemonade | Green beans |
| Bran cereals | Lemon-lime soda |
| Egg yolks | Root beer |
| | Powdered iced tea and lemonade mixes |

**Source:** United States Department of Agriculture (USDA) National Nutrient Database for Standard Reference, Release 17–1 (*www.nal.usda.gov/fnic/foodcomp/Data/SR17/wtrank/sr17a305.pdf;* accessed June 3, 2005)

## Keep Track of Test Results

If you have CKD, your doctor will order regular blood tests. Many patients find that keeping track of their test results helps them see how their treatment is working. Ask your doctor for copies of your lab reports and ask to have them explained. Note any results that are out of the normal range. When you learn how to read your reports, you will see how the foods you eat affect your kidneys. Talk with your doctor or your dietitian about what you can do to make healthier food choices. Remember that you are the most important member of your health care team.

## Hope Through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) has many research programs aimed at slowing the progression of chronic kidney disease. For example, the NIDDK is sponsoring the Chronic Renal Insufficiency Cohort study to determine the risk factors for rapid decline in kidney function and development of cardiovascular disease. This study of about 3,000 patients with chronic renal insufficiency, another way of describing CKD, will reflect the racial, ethnic, and gender composition of the people in the United States who have permanent kidney failure. The data collected and specimens obtained from people in this study will serve as a national resource for investigating CKD as well as cardiovascular disease. Establishing this group of patients and following them into the future will also provide an opportunity to examine genetic, environmental, behavioral, nutritional, quality-of-life, and health resource use factors in this population. The main part of the study will consist of monitoring patients and following up at regular clinic visits with kidney function measurements, cardiovascular studies, and laboratory tests. In addition, participants will answer questionnaires to assess various demographic, nutritional, and quality-of-life factors.

## Additional Reading

The following fact sheets and brochures, as well as other information, are available on request from the organizations listed. Most of them can also be found online at the web address given.

***Dining Out With Confidence: A Guide for Patients with Kidney Disease***
***Nutrition and Chronic Kidney Disease***
**National Kidney Foundation**
30 East 33rd Street
New York, NY 10016
Phone: 1–800–622–9010 or 212–889–2210
Email: info@kidney.org
Internet: www.kidney.org

***Facts About the DASH Eating Plan***
**National Heart, Lung, and Blood Institute Information Center**
P.O. Box 30105
Bethesda, MD 20824–0105
Phone: 301–592–8573
TTY: 240–629–3255
Fax: 301–592–8563
Internet: www.nhlbi.nih.gov

***A Healthy Food Guide for People with Chronic Kidney Disease***
**American Dietetic Association**
120 South Riverside Plaza
Suite 2000
Chicago, IL 60606–6995
Phone: 1–800–366–1655
Email: knowledge@eatright.org
Internet: www.eatright.org

***Kidney Beginnings: A Patient's Guide to Living with Reduced Kidney Function***
**American Association of Kidney Patients**
3505 East Frontage Road
Suite 315
Tampa, FL 33607
Phone: 1–800–749–2257 or 813–636–8100
Email: info@aakp.org
Internet: www.aakp.org

## For More Information

**American Kidney Fund**
6110 Executive Boulevard
Suite 1010
Rockville, MD 20852
Phone: 1–800–638–8299 or 301–881–3052
Email: helpline@akfinc.org
Internet: www.kidneyfund.org

**Food and Nutrition Information Center**
National Agricultural Library/USDA
10301 Baltimore Avenue, Room 304
Beltsville, MD 20705–2351
Phone: 301–504–5719
Email: fnic@nal.usda.gov
Internet: www.nal.usda.gov/fnic

**Life Options Rehabilitation Resource Center**
c/o Medical Education Institute, Inc.
414 D'Onofrio Drive
Suite 200
Madison, WI 53719
Phone: 1–800–468–7777
Email: lifeoptions@MEIresearch.org
Internet: www.lifeoptions.org

**National Kidney Disease Education Program**
3 Kidney Information Way
Bethesda, MD 20892
Phone: 1–866–4–KIDNEY (454–3639)
Email: nkdep@info.niddk.gov
Internet: www.nkdep.nih.gov

The information in this fact sheet should not be used in the nutritional counseling of infants, children, and adolescents with chronic kidney disease. Families of pediatric patients with CKD should seek age-appropriate nutritional counseling from a pediatric renal dietitian.

## About the Nutrition for Chronic Kidney Disease Series

The NIDDK Nutrition for Chronic Kidney Disease Series includes three fact sheets:

- Nutrition for Early Chronic Kidney Disease in Adults
- Nutrition for Later Chronic Kidney Disease in Adults
- Nutrition in Children with Chronic Kidney Disease

For free single printed copies of this series, please contact the National Kidney and Urologic Diseases Information Clearinghouse.

## National Kidney and Urologic Diseases Information Clearinghouse

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Email: nkudic@info.niddk.nih.gov
Internet: www.kidney.niddk.nih.gov

The National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health under the U.S. Department of Health and Human Services. Established in 1987, the Clearinghouse provides information about diseases of the kidneys and urologic system to people with kidney and urologic disorders and to their families, health care professionals, and the public. The NKUDIC answers inquiries, develops and distributes publications, and works closely with professional and patient organizations and Government agencies to coordinate resources about kidney and urologic diseases.

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. This fact sheet was reviewed by Lisa Murphy-Gutekunst, MSEd, RD, CSR, Cleve-Hill Dialysis, Buffalo, NY; and Marcy Bushman, MPH, RD, LDN, Sigma-Tau Pharmaceuticals.



This fact sheet is also available at *www.kidney.niddk.nih.gov.*


U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES
National Institutes of Health

NIH Publication No. 06–5572
January 2006